CLAIMS

What is claimed is:

1. An energy transfer element, comprising:

a magnetic element including an external surface; and

at least a first winding and a second winding wound around the external surface of the magnetic element without a bobbin such that energy to be received from a power converter circuit input is to be transferred from the first winding to the second winding through a magnetic coupling provided by the magnetic element to a power converter circuit output.

2. The energy transfer element of claim 1 wherein the external surface of the magnetic element includes a substantially curved surface.

3. The energy transfer element of claim 2 wherein a portion of the magnetic element including the external surface is substantially cylindrical.

4. The energy transfer element of claim 1 wherein the external surface of the magnetic element includes substantially planar surfaces.

5. The energy transfer element of claim 4 wherein a portion of the magnetic element including the external surface is substantially polygonal.

6. The energy transfer element of claim 1 wherein the first and second windings are wound directly around the external surface of the magnetic element without having to thread the first and second windings through an opening defined by the magnetic element.

7. The energy transfer element of claim 1 wherein the first winding comprises magnet wire.

8. The energy transfer element of claim 7 wherein the second winding comprises triple insulated wire.

9. The energy transfer element of claim 7 wherein the second winding comprises magnet wire.

10. The energy transfer element of claim 9 further comprising an insulating material between the first and second windings.

11. The energy transfer element of claim 10 wherein the insulating material comprises a coating applied by dipping.

12. The energy transfer element of claim10 wherein the insulating material comprises a coating applied by spraying.

13. The energy transfer element of claim 10 wherein the insulating material comprises a sleeve.

14. The energy transfer element of claim 13 wherein the sleeve comprises heat shrink tubing.

15. The energy transfer element of claim 1 further comprising two electrically conductive pins mounted to the magnetic element through an electrically insulating material.

16. The energy transfer element of claim 15 wherein each end of the first winding is coupled to a respective one of the two electrically conductive pins mounted to the magnetic element through the electrically insulating material.

17. The energy transfer element of claim 16 wherein both ends of the second winding are not coupled to electrically conductive pins mounted to the magnetic element through the electrically insulating material.

18. The energy transfer element of claim 1 further comprising a third winding wound around the external surface of the magnetic element without a bobbin such that energy to be received from a power converter circuit input is to be transferred from the first winding to the third winding.

19. The energy transfer element of claim 1 further comprising at least a partial exterior coating of a material having a magnetic permeability substantially greater than free space.

20. A method, comprising:

receiving energy from a power converter circuit input with a first winding wound around an external surface of a magnetic element without a bobbin;

transferring the energy from the first winding to a second winding wound around the external surface of the magnetic element without the bobbin through a magnetic coupling provided by the magnetic element between the first and second windings; and

coupling the energy from the second winding to a power converter circuit output.

21. The method of claim 20 further comprising regulating the energy transferred from the power converter circuit input to the power converter circuit

output by switching a connection between the power converter circuit input and the first winding in response to the power converter circuit output.

22. The method of claim 21 wherein switching the connection between the power converter circuit input and the first winding comprising switching the connection at a fixed frequency.

23. The method of claim 21 wherein switching the connection between the power converter circuit input and the first winding comprising switching the connection at a variable frequency.

24. The method of claim 21 wherein switching the connection between the power converter circuit input and the first winding comprising switching the connection with cycle skipping control.

25. The method of claim 21 wherein switching the connection between the power converter circuit input and the first winding comprising switching the connection with pulse width modulation.

26. The method of claim 20 further comprising:

rectifying an alternating current (AC) source to provide direct current (DC) source energy; and

coupling the DC source energy to be received by the power converter circuit input.

27. The method of claim 20 further comprising transferring the energy from the first winding to a third winding wound around the external surface of the magnetic element without the bobbin through the magnetic coupling provided by a magnetic element between the first and third windings.

28. The method of claim 20 further comprising insulating the second winding from the first winding.

29. The method of claim 28 further comprising triple insulating the second winding to insulate the first winding from the second winding.

30. The method of claim 28 further comprising coating the first winding and the magnetic element with an insulating material to insulate the first winding from the second winding.

31. The method of claim 28 further comprising spraying the first winding and the magnetic element with an insulating material to insulate the first winding from the second winding.

32. The method of claim 28 further comprising enclosing the first winding and the magnetic element in an insulative sleeve to insulate the first winding from the second winding.

33. The method of claim 32 further comprising heating heat shrink tubing enclosing the first winding and the magnetic element to insulate the first winding from the second winding.

34. The method of claim 20 further comprising coupling each end of the first winding to a respective one of the two electrically conductive pins mounted to the magnetic element through electrically insulating material without coupling both ends of the second winding to electrically conductive pins mounted to the magnetic element through electrically insulating material.

35. The method of claim 20 further comprising coating at least a portion of an energy transfer element formed with the first and second windings would around the magnetic element with a material having a magnetic permeability substantially greater than free space.